Project Name:	Bean Tunnel
Activity	Installation of Sheet Pile Wall
Task	Pre-augering and installation of sheet pile walls using silent piler
Prepared by:	B Clarke
Reviewed by:	

Resources and Materials		
Plant & Equipment	Service crane – type tbc Pre-auger rig – type tbc Giken silent press-in piler – type tbc Silent piler power pack – type tbc Silent piler reaction stand	Water pump Flame Cutting equipment Welding set Fuel bowser
Trades	Crane operator Piling operatives Welding & burning operative	
Materials	Sheet piles – type tbc	

PPE Requirements	
PPE:	*Standard site PPE – Hard hat (BS EN 397), Hi vis trousers (BS EN 471), Hi vis jacket/vest (BS EN 471), Protective toecap & midsole boots (BS EN 347), Light eye protection (BS EN 166), Gloves (BS EN 388)* *FFP3 dust mask (BS EN 149) – if gas cutting is continuous* *Hearing protection (BS EN 352) – mandatory if noise level exceeds 85dBA* *Welding Visor – during welding operation* *Flame retardant coverall – during welding or flame cutting operation* *Gauntlet gloves – during welding or flame cutting operation*

Permit Requirements
Permit to Break Ground – For all ground breaking operations *Hot Works Permit – For all flame cutting and welding activities* *Temporary Works Design (Permit to Load/Proceed) – For approval of temporary works platform prior to loading* *Lift Plan – For all lifting operations* *Access Permits/Licence*

Method of Work	
1.	Temporary piling platform to be constructed in accordance with approved Temporary Works Design and signed off for loading by Temporary Works Coordinator. Permit to Load/Proceed is to be issued by Temporary Works Coordinator before piling platform is loaded.
2.	Engineer is to set out line and level of sheet pile wall in accordance with Temporary Works Design. Permit to break ground to be issued prior to installation of setting out pins. Work area to be CAT scanned by trained and competent operative with all known services clearly marked on the ground prior to works commencing.
3.	Pre-auger rig is to mobilise to site to undertake pre-augering operation. Pre-auger probes will be completed along the centre line of the sheet pile wall at 600mm centres – all probing to be undertaken under control of permit to break ground. No probing to be undertaken within 1m of known service. Plant marshal will be in place, utilising two-way radio communications to communicate with operator throughout pre-auger operation. Exclusion zone to be in place around work area to ensure no unauthorised access into work area.
4.	During extraction of pre-auger probe, auger will be back-spin to reduce the amount of spoil. All pre-auger holes are to be backfilled upon completion to eliminate risk of fall from height. Where this is not possible, fencing is to be installed a minimum 1m from edge of pre-auger hole to prevent falls from height.
5.	On completion of pre-auger operation, all pre-augering plant and equipment is to be de-mobilised from site and piling plant mobilised. All plant and equipment is to be checked and inspected upon arrival at site with all pre-start checks completed. Any defective or non-conforming plant is not to be used.
6.	Service crane is to be set up on piling platform in accordance with location as indicated on Lift Plan. All piling plant, equipment and materials are to be offloaded by crane operator in accordance with approved lift plan. All lifting operations to be controlled slinger/signaller by way of two-way radio communications between crane operator and slinger/signaller.
7.	Reaction stand is to be set up at start of sheet pile wall in accordance with Temporary Works Design. Once reaction stand is in place, the silent piler and associated power pack is to be lifted into position on top of reaction stand. All lifting operations to be controlled by slinger/signaller in accordance with approved lift plan.
8.	Before works commence, a Permit to Break ground is to be briefed and issued to all operatives. Sheet pile wall line is to be CAT scanned by trained and competent operative, with all known services clearly marked on the ground. Installation of sheet piles is not permitted within 1m of known services.
9.	Whilst positioned on the reaction stand, the silent press-in piler will install the first three sheet piles to the design alignment and level. Once the first three sheet piles have been installed the piler will be free of the reaction stand and will sit atop of the installed piles. If required, the reaction stand can be removed and demobilised from site, reaction stand to be lifted from its position using service crane
10.	Sheet piles are to be lifted from the bundle of piles. Whilst laid in a horizontal position, shackle is to be fitted through the pitching hole at the top of the sheet pile. The sheet pile is then lifted by the service crane in accordance with the approved lift plan. Lift operation is to be controlled by Slinger/signaller, using two-way radio communications and guideline to direct the route of the sheet pile when elevated. Pile is then positioned within the silent piler and clamped within the jaws.
11.	During installation of a sheet pile, water supply is turned on to supply water to the toe of the pile as it is driven. The pile is driven in approximately 0.5m into the ground to provide stability before the ground shackle is released. Sheet pile is then pressed into the ground with a continuous water supply to the pile toe, operator to ensure that line and level is maintained throughout operation.
12.	After driving each pile to final level, a small weld is to be made at the top of each pile to hold them together. This helps to maintain the pile level and aids in increasing the reaction force required to install subsequent piles. All welding operations will be completed without any other operations taking place. All welding operations are to be undertaken under the control of a hot works permit.

13.	The above piling installation sequence will be repeated until the sheet pile wall is complete. The silent piler will continue with installation and walk across the top of the piles.
14.	On completion, the silent piler is to be lifted off of the sheet pile wall using the service crane. Slinger/signaller to control lifting operation with two-way radio communication and tag lines in place.
15.	During the course of the works if wind speeds exceed the maximum permitted level as outlined on the approved Lift Plan, works are to be suspended until wind speeds return to permissible levels.
16.	Due to use of the silent piler, noise levels are not expected to exceed 70dBA. If noise levels exceed 80dBA hearing protection is recommended, if noise levels exceed 85dBA hearing protection is mandated.
17.	Exclusion zone is to be installed around work area to ensure no unauthorised personnel are permitted within the work area during the operation. Exclusion zone is to be controlled by slinger/signaller or plant marshal, by way of two-way radio communications between slinger/signaller or plant marshal and plant operator.
18.	All static plant are to be supplied complete with drip trays and plant nappies. Emergency spill kit is to be provided at all work areas, with all operatives trained on correct use of spill kits.

Emergency Arrangements	
Fire:	*In the event of a fire, works are to be stopped immediately and emergency services contacted* *Appropriate fire extinguishers are to be available at point of work* *All operatives are to evacuate site and meet at designated Muster Point*
First Aid:	*Designated first aiders to be on site at all times* *In the event of an emergency, works are to stop immediately and designated first aider contacted. Emergency services to be contacted where required* *In the event of an incident, works are to stop immediately and designated first aider to be contacted* *Nearest Hospital –* ***Darent Valley Hospital, Darenth Wood Road, Dartford, DA2 8DA***
Rescue:	*Describe any rescue arrangements needed in the event of an incident i.e. fall arrest rescue, confined space rescue.*
Environmental:	*In the event of an environmental incident, works are to stop immediately, and a member of BB management team contacted immediately* *Environmental spill kits to be available at point of work*
Thames Water Requirements:	*Silent press-in piling has been selected to reduce vibrations resulting from the installation of sheet piles to limit the effect on any adjacent services and/or assets.* *Thames Water mains are to be positively identified by trial holes and locations surveyed and recorded prior to works commencing.* *Extent of mains are to be set out and briefed prior to works commencing.* *No mechanical excavation or ground breaking is to take place within 5m of the outermost edge of each main, unless prior approval received from Thames Water.*